

# LESSONS LEARNED

## Large-Scale Testing for Effects of AFA on Gas Retention/Release (Project #53030)

Consuelo E. Guzman-Leong

Pilot Plant Lessons Learned Technical Exchange

Hanford, Washington

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(Project #53030)

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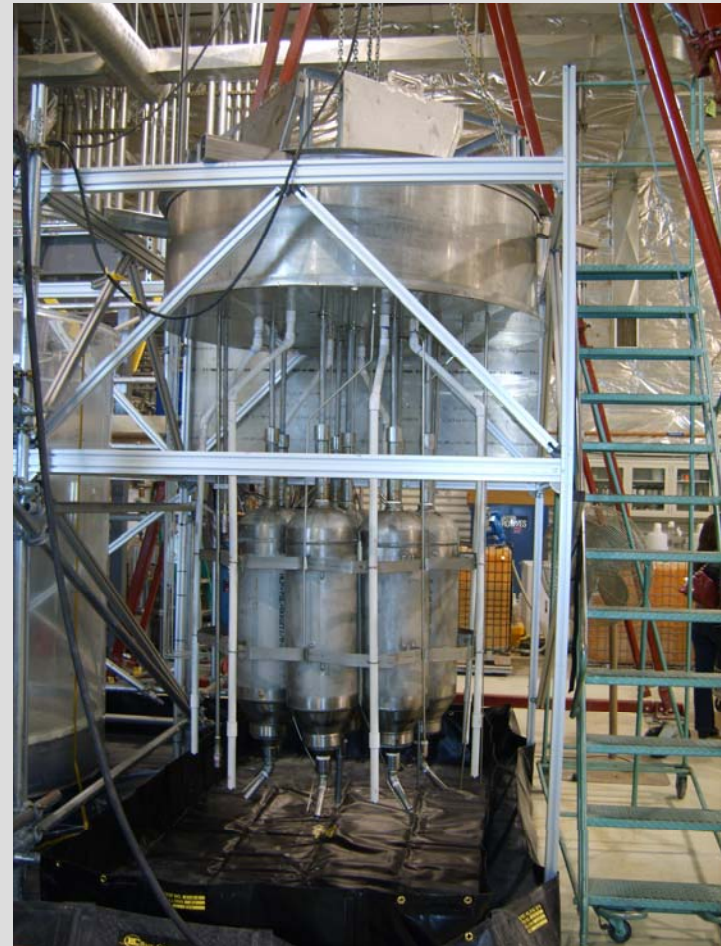
## ► Project Scope – (PNNL)

- Gas retention tests in 1/4-scale Lag Storage vessel
  - water, clay, AZ-101 chemical simulant with AFA
- Determine effect of simulant composition on gas retention with AFA
- Research gas composition effects on gas retention
- Develop a gas retention/release model based on test results

# Large-Scale Testing for Effects of AFA on Gas Retention/Release

(Project #53030)

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# **Lessons Learned**

## **Large-Scale Testing for Effects of AFA on Gas Retention/Release**

- ▶ **Procurements**
- ▶ **Simulant-related**
- ▶ **Testing**
- ▶ **Data Analysis**
- ▶ **Staff Resources and Communication**

# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Procurements

- Order equipment/instruments as soon as possible
- Spare parts, backup plans never hurt
  - Electric compressor failed
- If in doubt- get it calibrated

# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Simulant lessons learned

- Define your specification in detail
  - Speak the same language: ensure characterization methods are exactly the same (WTP approved procedure)
  - Have technical experts who wrote the procedure walk through the procedure with the vendor
- Simulant Shelf life: chemical and physical changes with storage
  - temperature sensitivity, biological growth, etc.—add biocide to clay
  - Allow time for kaolin/bentonite clay properties to stabilize

# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Simulant lessons learned (cont'd)

- Scaling issues, producing large batches require centrifuge rather than settling
- Expect variability between batches
  - Mix several batches on site to produce uniform simulant
- Mix/dilute simulant in totes prior to transferring into test vessel
  - Adjust rheology in totes before loading simulant into tank



# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Testing

- Rheology adjustment
  - use same dilution curve
- Don't start shift work before test stand is **100%** complete
- ½ hour shift overlap is adequate, 1 hour during 1<sup>st</sup> week
- Lead Test Engineers, think/plan 3 to 4 hours ahead

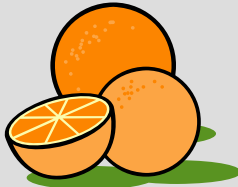


# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Data Analysis

- Plan early
- Staffing
  - Two or more is 😊/prudent
  - Independent of shift-work- don't mix 🍏 's and



- Stay current on analysis and reviews

# Lessons Learned

## Large-Scale Testing for Effects of AFA on Gas Retention/Release

### ► Staffing Resources and Communication

- While convenient to multi-task, don't underestimate big tasks
- Have a dedicated crafts support team
- Cross-training test crew members was helpful
- Communication is key
  - Documentation---have it in writing!
  - Sharepoint site and Test phone line for latest information



# **Lessons Learned**

## **Large-Scale Testing for Effects of AFA on Gas Retention/Release**

### **Summary**

- ▶ Procurements, simulant-related issues, testing tips, data analysis, staff resources and communication
  - Plan ahead, order parts early, get items calibrated
  - Test procedures should be specific, allow time for simulant to stabilize, expect batch variances
  - Cross-train staff members, lead test engineers plan ahead
  - Designate independent staff, keep up with analysis and reviews
  - Communicate frequently with staff, email, sharepoint and test phone line were efficient